

APPENDIX D: Dichotomous Field Key to Mapping Units at Lacreek NWR.

How to use the Key – On the following pages, plant associations and alliances are arranged in dichotomous couplets with corresponding field descriptions.

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Starting with the number "1", read through the groups of statements and select the one that is most appropriate. If necessary, follow the numbers in parentheses until a "best match" is found. Read the description to verify the match. It may be necessary to compare descriptions for similar associations by backtracking. The map code for each association is given in parentheses after each association name. Note that not all associations were mapped directly (1:1) on the map; consequently, some types may appear within alliances.

There will be some stands that do not match any of the descriptions exactly. Many plant associations are variable in composition and, while the descriptions attempt to address that variability, there will always be exceptions. Stands can represent transition zones between two vegetation types. Furthermore, there can be small inclusions of one type in larger stands of another. It is important to survey sufficiently large stands (≈ 0.5 ha or least 50 m diameter area around a point, or at least 100 m length in riparian areas) when classifying, and to base decisions on representative areas within stands.

1. Site supports > 10% tree and/or shrub cover (14).

1. Site mostly herbaceous; grasses and forbs. Shrubs and trees, if present, provide less than 10% aerial cover (2).

**1. Site mostly herbaceous cover with evidence of recent prairie dog activity (runs, mounds, holes, etc.).
Blacktailed Prairie Dog Grassland Complex (Map Unit 1.0)**

2. Sites located within sandhills portion of the Refuge. Site consists of deep, loose, sandy soils on undulating to rolling uplands in the southern portion of the Refuge. *Yucca glauca*, *Hesperostipa comata*, and *Calamovilfa longifolia* are common on slopes, shoulders, and summits. *Panicum virgatum* may be locally abundant in low lying areas (3).

2. Sites not within the sandhills portion of the Refuge. Site consists of moderately deep and deep, silty and loamy soils on nearly level to gently rolling uplands. Species composition can vary from wetlands to upland northern mixed grass prairie. *Yucca glauca* is not a prominent component of the community (7).

3. Foliar cover of *Yucca glauca* 10-25%. Herbaceous foliar cover consists primarily of *Hesperostipa comata* (= *Stipa comata*) and/or *Calamovilfa longifolia*.

3. Foliar cover of *Yucca glauca* < 10%. Dominant graminoids may include *Hesperostipa comata*, *Calamovilfa longifolia*, *Schizachyrium scoparium*, or *Panicum virgatum* (4).

**3a. Associated herbaceous species cover (graminoid) is <10%. (3a)
Yucca glauca / (Sparse Understory) Shrub Herbaceous Vegetation (Map Unit 2.1)**

**3b. Associated herbaceous species cover (graminoid) is >10%. (3b)
Yucca glauca / *Hesperostipa comata* Shrub Herbaceous Vegetation (Map Unit 2.2)**

**4. *Yucca glauca* plants visually prominent and herbaceous cover dominated by *Hesperostipa comata* (>10%).
Hesperostipa comata - *Yucca glauca* Herbaceous Vegetation (Map Class 3.1)**

4. *Yucca glauca* plants may be absent or, if present, density is relatively low. Dominant graminoids include *Hesperostipa comata*, *Calamovilfa longifolia*, *Schizachyrium scoparium*, or *Panicum virgatum*. (5).

**5. Site located in swale or depression and dominated by *Panicum virgatum*.
Panicum virgatum - (*Pascopyrum smithii*) Herbaceous Vegetation (Map Class 17.0)**

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5. Site located on nearly level to gently rolling uplands, moderately steep to steep slopes, or shoulders. If located in swale or depression, then not dominated by *Panicum virgatum*. **(6)**.
6. Site located on nearly level to gently rolling uplands dominated by *Calamovilfa longifolia* with *Hesperostipa comata* as the dominant secondary species.
Calamovilfa longifolia - Hesperostipa comata Herbaceous Vegetation (Map Unit 3.2)
6. Site located on nearly level to gently rolling uplands dominated by *Calamovilfa longifolia* with *Carex inops* ssp. *heliophila* or *Andropogon hallii* as the dominant secondary species.
Calamovilfa longifolia - Carex inops ssp. heliophila Herbaceous Vegetation (Map Unit 3.3)
6. Site located on moderately steep to steep (usually north facing) slopes and shoulders, and dominated by *Schizachyrium scoparium*.
Schizachyrium scoparium - Bouteloua gracilis - Carex filifolia Herbaceous Vegetation
Herbaceous Vegetation (Map Unit 4.0)
7. Site predominantly native species. Exotic species, if present, are minor components of the stand **(8)**.
7. Site predominantly (>50% cover) introduced/exotic species, which include *Cirsium arvense* **(7a)**, *Poa pratensis* **(7b)**, *Bromus inermis* **(7c)**, *Agropyron cristatum* **(7d)**, or *Thinopyrum intermedium* **(7e)**.
 - 7a. Dominant species is *Cirsium arvense* (Canada Thistle).
Cirsium arvense Patches (Map Unit 14.0)
 - 7b. Dominant species is *Poa pratensis* (Kentucky bluegrass).
Poa pratensis-Bouteloua gracilis-Carex filifolia Semi-Natural Herbaceous Vegetation (Map Unit 8.0).
 - 7c. Dominant species is *Bromus inermis* (Smooth brome).
Bromus inermis-(Pascopyrum smithii) Semi-Natural Herbaceous Vegetation (Map Unit 9.0.)
 - 7d. Dominant species is *Agropyron cristatum* (Crested wheatgrass).
Agropyron cristatum - (Pascopyrum smithii, Hesperostipa comata) Semi-Natural Herbaceous Alliance (Map Unit 10.0)
 - 7e. Dominant species is *Thinopyrum intermedium* (Intermediate wheatgrass)
Thinopyrum intermedium Semi-Natural Herbaceous Alliance (Map Unit 11.0)
8. Sites with moist to saturated soils dominated by *Schoenoplectus acutus* **(8a)**, *Juncus* **(8b)**, *Spartina* **(8c)**, *Phragmites* **(8d)**, mixed forb species (usually dominated by *Helianthus* spp.) **(8e)**, *Carex* **(8f)**, *Schoenoplectus pungens* **(8g)**, a mix of emergent species **(8h)**, *Glycyrrhiza lepidota* **(8i)**, *Polygonum amphibium* **(8j)** or *Typha* **(9)**,
8. Sites with silty and loamy soils that support predominantly native species characteristic of northern mixed grass prairie. Some sites may have been seeded. **(9)**
- 8a. Dominant species is *Scirpus acutus* and site is located in the sandhills region
Schoenoplectus acutus – Typha latifolia (Schoenoplectus tabernaemont) Sandhills Herbaceous Vegetation (Map Class 25.0).
- 8b. Dominant species is *Juncus balticus*.
Juncus balticus Seasonally Flooded Herbaceous Alliance (Map Class 21.0)

- 8c. Dominant species is *Spartina pectinata*.
Spartina pectinata - Carex spp. Herbaceous Vegetation (Map Class 19.0)
- 8d. Dominant species is *Phragmites australis*.
Phragmites australis Herbaceous Vegetation (Map Class 20.0)
- 8e. Dominated by a mix of forbs that may vary across the Refuge. *Helianthus* spp. are usually present.
Mixed Forb Herbaceous Vegetation (Map Class 13.0)
- 8f. Site is covered with a monotypic stand of *Carex nebrascensis*.
Carex nebrascensis Herbaceous Vegetation (Map Class 22.0)
- 8g. Small site dominated by *Schoenoplectus pungens*.
Schoenoplectus pungens Herbaceous Vegetation (Map Class 24.0)
- 8h. Mesic sites located in the sandhills region, mainly on private land, containing a mix of emergent wetland species. Site is associated with a stock pond or drainage.
Emergent Sandhills Wetland (Map Class 23.0)
- 8i. Small site dominated by *Glycyrrhiza lepidota*.
Glycyrrhiza lepidota Herbaceous Vegetation (Map Class 15.0)
- 8j. Rather large site dominated by monotypic stand of *Polygonum amphibium*.
Polygonum amphibium Herbaceous Vegetation (Map Class 16.0)
9. Site is dominated by thick stands of *Typha* spp. (cattails).
9. Site is not dominated by *Typha* spp (10)
- 9a. *Typha* occurs on regularly flooded sites that are associated with pools, ponds, or reservoirs.
Typha spp.–Great Plains Herbaceous Veg. (Semi-permanently Flooded) (Map Class 26.1)
- 9b. *Typha* occurs on sites that have only been flooded during seasonal flooding events.
Typha spp. – Great Plains Herbaceous Vegetation (Seasonally Flooded) (Map Class 26.2)
10. Sites do not appear to have been seeded with native species and appear more typical of northern mixed grass prairie. Topography ranges from nearly level to gently rolling. (11).
10. Sites appear to have been seeded with native species such as *Panicum virgatum* (10a), *Bouteloua curtipendula* (10b), or a mixture of native species (10c). Most sites appear as relatively uniform in composition and cover, and are usually found on nearly level sites. **Restoration Areas**
- 10a. Restoration site is dominated by *Panicum virgatum*.
Native Species Plantings (Panicum virgatum) (Map Class 35.3)
- 10b. Restoration site is dominated by *Bouteloua curtipendula*.
Native Species Plantings (Bouteloua curtipendula) (Map Class 35.1)
- 10c. Restoration site is dominated by mix of planted native graminoid species.
Native Species Plantings (Mixed Grasses) (Map Class 35.2)
11. Sites do not appear to have been manipulated or grazed and appear more typical of natural, undisturbed prairie. Topography ranges from nearly level to gently rolling. (12).

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- 11.** Sites appear to have been grazed or manipulated (other than seeded) with some non-native species and no clear dominant graminoid species. **Mixed Grasslands**
- 11a.** Site is dominated by a complex mix of warm season natives such as *Sporobolus spp.*, *Bouteloua spp.*, and *Panicum virgatum*.
Mixed Grassland (Warm Season Natives) (Map Class 12.2)
- 11b.** Site is dominated by a complex mix of cool season native such as *Pascopyrum smithii* and *Koeleria macrantha*. **Mixed Grassland (Cool Season Natives)** (Map Class 12.3)
- 11c.** Site is dominated by a complex mix of both warm and cool season natives.
Mixed Grassland (Map Class 12.1)
- 12.** Sites on fine textured soils, sometimes saline or alkaline, usually fairly level and appear to have a monoculture of either *Pascopyrum smithii* or *Distichlis spicata* (**13**).
- 12.** Sites on gently rolling, loamy soils usually on toe or foot slopes dominated by *Andropogon gerardii*.
Andropogon gerardii Herbaceous Vegetation (Map Unit 6.0)
- 12.** Sites on high terraces or slopes (shoulder or mid-slope), usually loamy or silty soils, dominant species is *Hesperostipa comata*.
Hesperostipa comata – Bouteloua gracilis – Carex filifolia Herbaceous Vegetation (Map Unit 5.0)
- 13.** Site not associated with saline or alkaline soil. Stand appears as a monotypic stand of *Pascopyrum smithii*. **Pascopyrum smithii- Bouteloua gracilis - Carex filifolia Herbaceous Vegetation** (Map Unit 7.0).
- 13.** Sites with saline or alkaline soils located near ponds or streams, sometimes associated with a fluctuating water table. Species composition is usually a monotypic stand of *Distichlis spicata* (**13b**) or *Hordeum jubatum* (**13a**), often closely associated with stands of *Spartina pectinata*. The site may contain inclusions of *Poa pratensis*, *Hordeum jubatum*, or *Pascopyrum smithii*.
- 13a.** Site site is completely dominated by *Hordeum jubatum*.
Hordeum jubatum Herbaceous Vegetation (Map Class 18.1)
- 13b.** Site is completely dominated by *Distichlis spicata*.
Distichlis spicata Herbaceous Vegetation (Map Unit 18.2)
- 14.** Site primarily vegetated by shrub species (**15**).
- 14.** Site primarily vegetated by trees > 4 m in height with foliar cover > 10%, and typically greater than 25%.
- 14a.** Site dominated by *Salix amygdaloides* trees growing along riparian and floodplain corridors.
Salix amygdaloides Woodland (Map Class 32.0)
- 14b.** Site is dominated by a small stand of *Populus deltoides* trees.
Populus deltoides Woodland (Map Class 33.0)
- 14c.** Site is dominated by a small stand of *Celtis occidentalis* trees in the Sandhills region.
Celtis occidentalis Woodland (Map Class 31.0)
- 14d.** Site is contains a small stand of *Fraxinus pennsylvanica* trees

Fraxinus Pennsylvanica Woodland (Map Class 34.0)

- 15.** Sites are dominated by *Symphoricarpos occidentalis* occurring in upland prairie locations; usually swales or dry drainages.

Symphoricarpos occidentalis Temporarily Flooded Shrubland Alliance (Map Class 27.0)

- 15.** Sites are dominated by *Prunus americana* (**15a**), *Salix exigua* (**15b**), or *Amorpha fruticosa* (**15c**), mostly < 4 m in height; however, heights for *Prunus americana* and *Salix exigua* can approach 5 m in height. Stands occur in mesic sites. Shrub cover > 10% and usually > 25%.

- 15a.** Site is dominated by thick stands of *Salix exigua*.

Salix exigua / Mesic Graminoids Shrubland (Map Class 30.0)

- 15b.** Site is dominated by small pockets of *Prunus americana*.

Prunus americana Shrubland (Map Class 28.0)

- 15c.** Site is dominated by *Amorpha fruticosa*.

Amorpha fruticosa Shrubland (Map Class 29.0)